

What is claimed is:

1. A tire winch for attachment to a vehicle tire, said tire winch comprising:

a spool having a substantially cylindrical hub;

a means for attaching said spool to the vehicle tire such that a rotation of the vehicle

5 tire causes a first point on said spool to rotate about an arc that is substantially equal to an arc rotated by a second point on said vehicle tire; and

a torque-limiting means for causing said first point on said spool to rotate about an arc that is substantially less than an arc rotated by a second point on said vehicle tire when a torque exerted upon said spool exceeds a predetermined limit.

10 2. The tire winch as claimed in claim 1 wherein said torque-limiting means comprises a ratchet mechanism.

3. The tire winch as claimed in claim 1 wherein said hub is dimensioned such that an outer diameter of said hub is at least 40% of an outer diameter of the vehicle tire.

4. A tire winch for attachment to a vehicle tire, said tire winch comprising:

15 a spool comprising a substantially cylindrical hub having an outer diameter that is at least 40% of an outer diameter of the vehicle tire; and

a means for attaching said spool to the tire such that a rotation of the vehicle tire causes a first point on said spool to rotate about an arc that is substantially equal to an arc rotated by a second point on said vehicle tire.

20 5. The tire winch as claimed in claim 4 wherein said means for attaching said spool to the vehicle tire comprises a ratchet mechanism adapted to cause said first point on said spool to rotate about an arc that is substantially less than an arc rotated by a second point on said vehicle tire when a torque exerted upon said spool exceeds a predetermined limit.

6. A tire winch kit for attachment to a vehicle tire, said tire winch kit comprising:
an unwinding spool comprising a substantially cylindrical hub having an outer
diameter that is at least 40% of an outer diameter of the vehicle tire;

5 a winding spool comprising a substantially cylindrical hub having an outer diameter
that is less than 40% of an outer diameter of the vehicle tire; and

a means for attaching one of said unwinding spool and said winding spool to the
vehicle tire such that a rotation of the vehicle tire causes a first point on said spool to rotate
about an arc that is substantially equal to an arc rotated by a second point on said vehicle tire.

7. The tire winch kit as claimed in claim 6 further comprising a flexible pulling
10 member dimensioned for attachment to said outer diameter of said hub.

8. The tire winch system as claimed in claim 6 wherein said flexible pulling member
is a strap.

9. The tire winch kit as claimed in claim 6 wherein said means for attaching one of
said unwinding spool and said winding spool to the vehicle tire comprises a plurality of
15 blocks extending from an outer surface of a rim of said tire, and wherein each of said winding
spool and said unwinding spool comprise a plurality of toothed sections dimensioned to mate
with said plurality of blocks.

10. The tire winch kit as claimed in claim 9 further comprising a plurality of clips
dimensioned to secure one of said winding spool and said unwinding spool to said tire.

20 11. The tire winch kit as claimed in claim 6 wherein said means for attaching one of
said unwinding spool and said winding spool to the vehicle tire comprises a hub mounted
bracket comprising a plurality of holes disposed and dimensioned to mate with a plurality of
lugs of said vehicle tire and a plurality of teeth, and wherein each of said winding spool and

said unwinding spool comprise a plurality of toothed sections dimensioned to mate with said plurality of teeth of said hub mounted bracket.

12. The tire winch kit as claimed in claim 11 further comprising a plurality of clips dimensioned to secure one of said winding spool and said unwinding spool to said tire.

5 13. The tire winch kit as claimed in claim 6 further comprising a torque-limiting means for causing said first point on said spool to rotate about an arc that is substantially less than an arc rotated by a second point on said vehicle tire when a torque exerted upon said spool exceeds a predetermined limit.

10 14. The tire winch kit as claimed in claim 13 wherein said torque-limiting means comprises a ratchet mechanism.

15 15. A method for pulling an object, said method comprising the steps of:

attaching a tire winch comprising a spool and a hub to a drive wheel of a vehicle, wherein said hub has a diameter that is less than a diameter of a tire of said drive wheel of said vehicle;

15 wrapping a first end of said flexible pulling member around said hub such that only a small portion of a length of said flexible pulling member extends therefrom;

attaching a second end of a flexible pulling member to the object to be pulled;

engaging said drive wheel of said vehicle such that said vehicle moves away from said object and such that said that said flexible pulling member unwinds from said hub; and

20 continuing said engagement of said drive wheel of said vehicle until said pulling member disengages from said hub;

whereby said object is pulled a distance that is less than a distance traveled by said vehicle.